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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/920,633	08/03/2001	Osamu Nagano	02887-0208	6947

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EXAMINER

NGUYEN, LAM S

ART UNIT PAPER NUMBER

2853

DATE MAILED: 04/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/920,633

Applicant(s)

NAGANO ET AL.

Examiner

LAM S NGUYEN

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5-20 and 25 is/are allowed.
- 6) ☒ Claim(s) 1-4, 21-24 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-4, 21-24, 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Miyoshi et al. (US 6525328).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

Referring to claims 1, 21, 23-24:

Miyoshi et al. disclose a charged particle beam exposure system comprising: a charged particle beam emitting device (FIG. 2, element 71) which generates charged particle beams with which a substrate is irradiated (FIG. 2, element 21), said charged particle beam emitting device generating the charged particle beams at an accelerating voltage which is lower than that at which an influence of a proximity effect occurs (Abstract), the proximity effect being a

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phenomenon in which at least one of a secondary charged particle and a reflected charged particle which is produced from the surface of the substrate irradiated with the charged particle beams influence an exposure extent of a pattern which is adjacent to a pattern to be written (column 1, line 25-48);

an illumination optical system which adjusts a beam diameter of the charged particle beams so that density of the charged particle beams is uniform (FIG. 2, element 72 or FIG. 4, element 53);

a character aperture in which an aperture hole is formed in a shape corresponding to a desired pattern to be written (FIG. 2, element 73 or FIG. 4, element 5);

a first deflector which deflects the charged particle beams by an electrostatic field that the charged particle beams have a desired sectional shape and travel towards a desired aperture hole and which returns the charged particle beams passing through said aperture hole to an optical axis thereof (FIG. 4, element 4);

a reducing projecting optical system which forms a multi-pole lens field so that the charged particle beams passing through said character aperture substantially reduce at the same demagnification both in X and Y directions when the optical axis extends in Z directions (FIG. 2, element 74) and form an image on the substrate (FIG. 2, element 21) without forming any crossover between said character aperture and the substrate (Abstract); and

a second deflector which deflects the charged particle beams passing through said character aperture by means of an electrostatic field to scan the substrate with the charged particle beams (FIG. 4, element 6).

Referring to claims 2, 22: wherein said reducing projecting optical system includes multi-pole lenses the number of which is N_1 , N_1 being a natural number of 3 or more (FIG. 5, element 8 (Qb1-Qb4); $N_1 = 4$).

Referring to claim 3: wherein said second deflector deflects the charged particle beams in the X directions and the charged particle beams in said Y directions independently to each other (FIG. 4, element 6).

Referring to claim 4: wherein said N_1 is 4 (FIG. 5, element 8 (Qb1-Qb4); $N_1 = 4$).

Referring to claim 26: wherein said plurality of multi-pole lens fields having a first multi-pole lens field closet to the character aperture, said first multi-pole lens field forming a divergent electrostatic field in one direction of the X and Y directions and forming a convergent electrostatic field in other direction of the X and Y directions (FIG. 8, element Qb1 and column 12, line 62 to column 13, line 5).

Allowable Subject Matter

2. Claims 5-20 and 25 are allowed.

Referring to claims 5 and 25: The most pertinent art fails to disclose wherein said four multi-pole lenses are controlled to form first through fourth electrostatic fields so that said first through fourth electrostatic fields sequentially form a divergent electrostatic field, a divergent electrostatic field, a convergent electrostatic field, and a divergent electrostatic field, in one direction of the X and Y directions and so as to sequentially form a convergent electrostatic field, a convergent electrostatic field, a divergent electrostatic field and a convergent electrostatic field in the other direction of the X and Y directions. Therefore, the claimed invention is not disclosed by the cited prior art.

Referring to claim 13: The most pertinent art fails to disclose wherein the inside diameter of said first multi-pole lens and said second multi-pole lens is a first inside diameter and the inside diameter of said third multi-pole lens and said fourth multi-pole lens is a second inside diameter which is greater than said first inside diameter. Therefore, the claimed invention is not disclosed by the cited prior art.

Claims 6-12, 14-20 are allowable because they depend directly/indirectly on claim 5 or 13.

Response to Arguments

Applicant's arguments filed 03/10/2004 have been fully considered but they are not persuasive.

Regarding to the argument referring to claims 1, 21, 23-24: The applicants argued that Miyoshi fails to teach "a reducing projecting optical system which forms a multi-pole lens field so that the charged particle beams passing through said character aperture substantially reduce at the same demagnification both in X and Y directions when the optical axis extends in Z directions and form an image on the substrate without forming any crossover between said character aperture and the substrate". However, as disclosed in Abstract, FIG. 2 to FIG. 8, Miyoshi discloses an electron beam lithography system comprising multiple lenses and a CP aperture wherein "the electron beam leaving the CP aperture 5 as an aperture image is incident on a substrate 21 at the same demagnification in the minor-axis and major-axis directions and at different incident angles in the minor-axis and major-axis directions while passing through the trajectory without establishing any crossovers". Therefore, the argument is not persuasive.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN

April 22, 2004



HAI PHAM
PRIMARY EXAMINER